

U N I V E R S I T Y O F I L L I N O I S

PROPOSALS FOR THE EXPANSION OF EDUCATION
IN THE HEALTH PROFESSIONS -- 1967-1980

A Report Submitted to the Director of the
Study of Education in the Health Fields,
Illinois Board of Higher Education

December 13, 1967

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I. INTRODUCTION AND SUMMARY

The University of Illinois presents this report in response to a request for a statement of proposals for the expansion of education in the health professions -- for consideration in the Study of Education in the Health Fields being conducted by the Illinois Board of Higher Education.

An earlier report -- sent to the Research Director for the Study in January 1967 -- outlined the University's current programs in these fields, described developments already under way in some of them, and summarized proposals still being discussed in several others. After further study by the University Council on the Health Sciences and Professions, an outline of a comprehensive program covering the major professions directly concerned with human health care was approved in principle by the Board of Trustees on October 16, 1967. The present document is an elaboration of those proposals, together with an account of plans for growth in certain fields that were omitted from the earlier statement.

General Objectives

The University's program rests on several assumptions as to the State's needs in the health fields, which seem to be justified by the results of numerous studies of professional manpower in relation to the rising demand for better health care. These needs may be stated as follows:

1. Greater opportunity for Illinois youth to secure professional education in the health fields. Admission to most of these professions -- especially medicine and dentistry -- has been limited by the shortage of educational facilities.
2. Increase in the number of graduates of professional training programs in the State -- as one step towards overcoming the shortage of its professional manpower.

3. Greater efficiency and effectiveness in the educational programs of the various health fields.
4. Increased retention within Illinois of the graduates of its health-professional schools.
5. Better methods of organizing and disseminating information about advances in science and technology to practitioners.
6. Improved utilization of professional manpower and other resources in the delivery of health services.
7. Expanded research on the hazards to health due to unfavorable environmental conditions, and development of the means to preventing or ameliorating such conditions.

Summary of Proposals

The University of Illinois has long conducted educational programs for most of the health professions and for graduate degrees in related sciences. The developments proposed in this report, therefore, would consist mainly in the expansion of existing programs through more extensive involvement of its three campuses and affiliated health facilities. In addition, new programs are proposed in public health, in the postdoctoral aspects of medical education, in certain technical specialties, and in research on the delivery of health care.

The suggested schedule of development extends to 1980, which is the terminal date currently being used in most of the University's long-range planning. The following paragraphs summarize briefly the nature and scope of the proposals made for the several educational areas. More detailed descriptions of these programs are presented in subsequent sections of the report.

1. Medicine

Substantial expansion is proposed for all three levels of professional education in medicine -- undergraduate, graduate, and postgraduate -- as well as program changes designed to achieve more effective coordination and integration within and between these components of the total educational sequence. Significant savings in time and cost -- as well as improvement in the quality of education -- should result from these innovations. It is hoped that these and other advantages of the total program would induce a larger proportion of M.D. graduates to remain to practice medicine in Illinois.

Undergraduate medical education (M.D. degree). The present enrollment for the M.D. degree would be approximately doubled -- involving an increase in the entering class from 205 to 405 students. The addition of 200 beginning students would be accomplished in two equal increments -- separated by two to four years -- with each group of 100 students and the continuing classes constituting the student body of a somewhat autonomous unit that could be organized as a "school."

School I. The first class of 100 would be admitted in 1972 or 1973 -- depending on availability of facilities, for which no State funds could be provided before 1969-70. The first year would be spent at the Urbana-Champaign campus in intensive study of basic medical sciences. The preceding four-year baccalaureate program would have been carefully planned so as to prepare students for the new medical curriculum.

The following three years would be spent in Chicago -- in a specially-organized program of clinical training, together with additional instruction in aspects of the medical sciences directly applicable to clinical problems and practice. The School would function as part of the College of Medicine. It is assumed that satisfactory affiliation arrangements could be made with a major hospital (or hospitals) for the School's clinical program. The latter would include as much as possible of the training currently given in the internship.

School II. Unless the experience with School I dictated otherwise, a similar educational program might be followed for School II. The first class could perhaps be admitted by 1975, although the date might be earlier or later -- depending on the availability of facilities. Various possibilities are discussed for the location and administration of the medical-science and clinical components of the instructional program. The alternative of adding clinical instruction and operating a separate medical college at Urbana-Champaign is recommended if a full medical school is to be established outside the Chicago area.

Graduate medical education. The University proposes to establish an Institute of Postdoctoral Medicine which would develop and administer programs of graduate and postgraduate training for physicians in cooperation with affiliated hospitals. A statewide network of regional training centers somewhat similar to that proposed by Indiana University is envisioned. The graduate component might consist of a two-year residency program -- open to individuals with clinical training equivalent to that provided in the medical curriculum suggested for the new "schools" above (i.e., clerkship plus internship). Federal and State funds would be sought for support of the training costs of the hospitals and for stipends to trainees.

Postgraduate medical education. A greatly expanded program of continuing education for practicing physicians would also be administered through the proposed Institute of Postdoctoral Medicine. The combined graduate-postgraduate operations should be mutually reinforcing and should result in the creation of health-care centers of high professional quality -- possibly to be related to the Regional Medical Centers Program. Through the Institute, research and development on the methodology and substance of continuing education for physicians would be conducted, with the collaboration of the Center for the Study of Medical Education in the College of Medicine and the Computer-Based Education Research Laboratory in the Graduate College.

2. Dentistry

Enrollment for the professional degree in dentistry (D.D.S.) would be increased from the present entering class of 99 to a total of 200 by 1980 -- with total enrollment increasing from 353 to 766 students. Funds have already been provided for the construction of a new building that would accommodate part of this enrollment increase.

In addition to professional students, substantial increases in enrollment are projected for dental students enrolled in the Graduate College (from 33 to 87 by 1980), postgraduate students (from 17 to 75), and dental assistants (from 26 to 50). Two new paradental programs are being planned: dental hygienists and dental technicians, with projected enrollments of 46 students each by 1980.

3. Nursing

Approximately a fivefold increase in total enrollment in the College of Nursing at the Medical Center is projected by 1980 -- from 276 to 1318. The professional baccalaureate program would increase from the current total of 238 (beginning class of 75) to 753 (beginning class of 250) by 1980. The rates of increase would be higher at the graduate level, in programs designed to train clinical specialists, teachers of nursing, and administrators. Candidates for the master's degree would increase from 38 to 565 by 1980; and a new doctoral program would be established, in which an enrollment of 40 by 1980 is estimated.

A new building for the College of Nursing is under construction which should accommodate the greater part of these increases. Additional space and other resources would be required, however, in order to accommodate the enrollments projected for 1980.

4. Pharmacy

The University's College of Pharmacy is the only professional school in this field in the State. Its current enrollment in the professional program is virtually in balance with demand (a total enrollment of 576 for the current semester, with an entering class of 196). A total of 771 professional students is projected for 1980 (with an entering class of 245). Substantial increases in graduate enrollments for the master's degree and the doctorate are also predicted.

5. Public Health

The University does not grant professional degrees in the field of public health, but new programs are proposed for the master's degree (M.P.H.) and the doctorate (D.P.H.) -- to be administered by a new School of Public Health.

6. Social Work

The professional degree of Master of Social Work is offered by the Jane Addams Graduate School of Social Work, in two parallel programs at the Chicago Circle and the Urbana-Champaign campuses. Marked expansion of enrollment in both programs is projected: from 151 to 550 by 1980 at Chicago Circle, and from 87 to 355 at Urbana-Champaign. In addition, plans for the establishment of a doctoral program in social work are under discussion -- for the training of teachers, research personnel, and administrators.

7. Associated Medical Specialties

Four programs are now offered for baccalaureate degrees: medical art, medical records administration, medical technology, and occupational therapy.

Students usually enroll for three years in an undergraduate college and transfer to the School of Associated Medical Sciences at the Medical Center for the professional component of their training.

Two new programs are being planned (medical dietetics and physical therapy), and some sixteen other areas have been identified for discussion that might lead to future programs.

8. Veterinary Medicine

Enrollment in the professional curriculum for the D.V.M. degree is projected to increase from the current total of 259 to 363 by 1980. Enrollment in the Graduate College for degrees in veterinary medical science now totals 47 and is predicted to be 117 by 1980.

The College of Veterinary Medicine is the focus of important research in the general field of public health, through the interdisciplinary Center for Zoonoses Research. Efforts are being made to secure new facilities for this program and for substantial expansion of research in the public-health aspects of bacteriology, climatology, ecology, epidemiology, geography, and virology.

9. Related Sciences

The Urbana-Champaign campus of the University of Illinois has long been an outstanding center for graduate study and research in the behavioral sciences, the biological sciences, the physical sciences, and engineering -- all of which have highly significant health-related programs. The University stands near the top of all graduate institutions in the country in the number of doctoral degrees granted. Substantial increases in graduate enrollment are projected in all fields related to health.

Graduate study has just been inaugurated at the Chicago Circle campus. As rapidly as space and other resources will permit, these programs will be expanded in the fundamental branches of science, in bioengineering, and in the applied fields related to urban problems.

10. Center for the Study of Patient Care and Community Health

This Center would conduct interdisciplinary studies on a broad base designed to improve the utilization of professional manpower and other resources in the delivery of health care. With the collaboration of faculty members from various departments, colleges, and campuses, the Center would expect to study such problems as health maintenance, early disease detection, primary disease prevention, and environmental health -- including aspects of social and community structure that influence patterns of illness. These research objectives would seem largely to coincide with the interests of the Center for Health Services Research and Development being planned by the U. S. Department of Health, Education, and Welfare.

II. MEDICINE

There has been growing awareness in recent years of an increasing national shortage of physicians relative to demand -- especially as regards services provided directly by physicians to patients. The nature and magnitude of this deficiency have been amply documented in numerous studies sponsored by governmental agencies and professional organizations. The most recent is the report by the National Advisory Commission on Health Manpower published in November 1967.^{1/} Clearly, the rate of increase in the number of physicians has not kept pace with the demand generated by a growing population, rising expectations of improved health care, increasing subsidy of health care, and expanded involvement of physicians in professional functions other than the treatment of patients.

Illinois has lagged behind the national average in the effort to keep pace with these growing demands -- partly due to the exodus of Illinois-educated physicians to other states for postdoctoral training and eventual practice.

In order to help the State meet these growing needs, the University of Illinois presents in the following pages a comprehensive set of proposals covering the entire range of medical education: undergraduate, graduate, and postgraduate. Although universities traditionally have avoided involvement in the graduate education of physicians -- except for the training of

^{1/} Report of the National Advisory Commission on Health Manpower (Volume I). Washington, D. C.: Government Printing Office, November 1967. Pp. viii + 93.

interns and residents in their own hospitals -- at least three recent studies of medical education and health-care needs have urged that universities move formally into this important area of training.^{1/2/3/} The following statement is from the latest of these reports:

"We are convinced that an integrated educational system is a prerequisite to an integrated health manpower team, and we view the inclusion of formal professional training within the university as an opportunity both to achieve this end and to permit significant curriculum reform. We therefore recommend that formal education for all health professionals be conducted under the supervision of universities. This would include graduate training such as internships, residencies, and their equivalents."^{3/}

The University proposes to undertake an extensive program of expansion and experimentation which not only would achieve better integration among the three levels of medical education -- thus improving its quality -- but should also contribute towards these beneficial results: (a) a substantial increase in the number of physicians graduated; (b) a shortening of the total training period; (c) improvement in the professional environment for physicians in the State; (d) an increase in the proportion of graduates of Illinois medical schools who practice medicine in the State; (e) improvement in the quality and better geographic distribution of health care in Illinois.

^{1/} Coggeshall, Lowell T., Planning for Medical Progress Through Education -- A Report Submitted to the Executive Council of the Association of American Medical Colleges. Evanston: Association of American Medical Colleges, 1965. Pp. x + 107.

^{2/} The Graduate Education of Physicians -- The Report of the Citizens Commission on Graduate Medical Education (J. S. Millis, Chairman). Chicago: Council on Medical Education, American Medical Association, 1966. Pp. xii + 114.

^{3/} Report of the National Advisory Commission on Health Manpower (Volume I). Washington, D. C.: Government Printing Office, November 1967. Pp. viii + 93.

Undergraduate Medical Education

Although the University of Illinois stands near the top of medical schools in the country in size of enrollment, it is proposed that the number of students be approximately doubled by 1980 -- i.e., from the present figure of 779 to at least 1560 by 1980. The size of the entering class in medicine would be increased from 205 to 405.

In general, the enrollment increase would be accommodated by offering medical instruction at the Urbana-Champaign campus and by expanding it in the College of Medicine in Chicago. Various possibilities have been considered for utilizing the combined resources of the two campuses, including the one outlined in the statement of October 16, 1967. That proposal called first for a preclinical two-year program with a beginning class of 100 at Urbana-Champaign, and for the transfer of the students to Chicago for two years of clinical training. After each campus had built the necessary facilities, however, it was assumed: (a) that the Urbana-Champaign campus would add two years of clinical training and grant the M.D. degree independently; and (b) that the College of Medicine would add 100 entering students to its present 205, thus replacing the transfer contingent previously accepted from Urbana-Champaign and maintaining junior-senior enrollment at the expanded level.

Further consideration has raised some doubts about that plan. For one thing, it would tend to link the Urbana-Champaign campus' preclinical curriculum rigidly to whatever was the current one at the Medical Center, thus preventing flexibility and experimentation. Hence, an alternative pattern is suggested which would make experimentation possible both with the preclinical

and the clinical parts of the curriculum followed by the Urbana-Champaign contingent. Under this plan, a group of 100 beginning medical students (plus the continuation classes at second-, third-, and fourth-year levels) would become the student body of a semiautonomous "school,"^{1/} for which an independent curriculum could be organized. Two such "school" groups would be constituted from the 200 beginning students (plus continuation classes) to be added to the University's medical enrollment. These units would be established at different times -- "School I" preceding "School II" by at least two years -- the exact phasing to depend on availability of resources and other considerations.

School I

An experimental curriculum is suggested for this group, with attention to integration with the preceding premedical program as well as with the postdoctoral period of graduate education. The net result should be the shortening by at least one year of the total span of formal medical education (undergraduate and graduate).

Organization and administration. School I would be established as a semiautonomous unit within the College of Medicine -- the specific organizational structure to be determined through regular University procedures, and the arrangements with an affiliated hospital (or hospitals) to be determined by negotiation.

^{1/} This plan of organization was suggested in the report of a task force of the College of Medicine dated March 29, 1967. Although not formally approved by the faculty of the College, it is nevertheless presented here as a possible means to expanding enrollment while permitting flexibility of program, administrative organization, provision of facilities, and arrangements with affiliated hospitals. Further careful study would obviously be needed before detailed operational plans could be made.

Admission and registration of students. Applicants would be admitted to School I as medical students, and would spend their first year at the Urbana-Champaign campus in intensive study of medical sciences. Students would be admitted from other institutions than the University of Illinois at Urbana-Champaign, but their premedical study must have prepared them for the first year of the new medical curriculum. Evidence of proficiency in the basic-science subjects would be accepted in lieu of formal courses.

Curriculum. A four-year baccalaureate program would be required for admission, but it should contain some of the material now offered in the first-year medical curriculum. The premedical program would be planned so as to prepare the student for the intensive year of medical-science instruction at the Urbana-Champaign campus. This would be followed by three years in Chicago devoted mainly to clinical education but including also further instruction in the aspects of the medical sciences directly related to clinical problems and practice. During the three-year period of clinical study -- and especially in the fourth year -- the student would be given as much as possible of the training now included in the conventional internship. Upon graduation he would presumably be prepared to enter upon a first year of residency. The program of graduate education which the University of Illinois proposes to develop would be specifically planned for such a transition.

Schedule. Since no funds even for planning new facilities would be available until 1969, the earliest possible date for beginning instruction would be 1972; more likely, the initiation date would be 1973, since a period of three years barely allows enough time for planning and constructing a University laboratory building where the program has been well defined; in the present case, more than the average amount of time would have to be spent in educational planning before architectural work could be undertaken.

Arrangements for clinical training. Since this program would require a unique pattern of clinical training, it probably would be most convenient if the curriculum were planned so that the greater part of the work could be concentrated in a single affiliated hospital. It is assumed that a mutually satisfactory organizational model could be devised for both administrative and instructional functions. As already noted, the School presumably would be administered as a semiautonomous unit within the College of Medicine.

School II

An additional increment of 100 beginning students, together with the three continuation classes, would constitute the student body for School II. Decisions concerning the organization, the administration, and the curriculum for School II would be guided by an evaluation of the experience with School I and by a systematic appraisal of such factors as the nature of the potential student body, the availability of clinical facilities, the comparative cost-benefit relations vis-a-vis the construction of new facilities, and the estimated quality of the program under various possible conditions.

Assuming that the general educational program of School I had turned out to be satisfactory, the following appear to be the principal possibilities for continuing it with School II:

1. Increase enrollment in the first-year medical program at Urbana-Champaign to 200 students, selecting one of the following alternatives for provision of the clinical training:
 - (a) Offer clinical instruction at Urbana-Champaign through the use of local and regional hospitals and construction of a medium-sized hospital -- if needed -- for use by the School's full-time clinical faculty. An independent college of medicine would be established to administer the program.
 - (b) Alternatively, organize a new clinical training unit in the Chicago metropolitan area, utilizing a different set of hospital affiliations. School II would then be administered in the same way as proposed for School I -- as a semiautonomous unit within the College of Medicine.
2. Offer the entire program in Chicago, with the first-year component being conducted by the medical-science departments of the College of Medicine. (Alternatively, it might be possible to offer the first-year program at the Chicago Circle campus and at the campuses of other State universities -- if staff and

laboratory resources of requisite quality could be provided. (It should be noted, however, that the duplication of satisfactory laboratory facilities in these fields for small groups could result in very high unit costs.)

The possibility of establishing a separate medical school at the Urbana-Champaign campus should be carefully investigated in terms of all aspects of the cost-benefit relationships involved. If a new medical school is to be established outside the Chicago area, the wealth of resources at the Urbana-Champaign campus in the biological, physical, and behavioral sciences is such as to argue very strongly for the location of the school at that campus. In a later section of this report, a brief description is given of the graduate and research resources in these fields at Urbana. Without question, several million dollars would be saved by locating a medical school there rather than at any other downstate site -- assuming comparable levels of faculty quality and supporting resources.

Graduate Medical Education

. It is proposed to organize and administer a new program of graduate education for physicians through an Institute of Postdoctoral Medicine. (The Institute would also have responsibility for a statewide program in continuing medical education.) It would seek to establish a network of training centers involving one or more cooperating hospitals in several metropolitan areas of the State -- using federal and State funds to defray the strictly educational costs and for at least part of the stipends paid to trainees. Very little graduate education in medicine now takes place in Illinois outside Chicago. The proposed program would be a systematic effort towards changing that situation.

It is tentatively proposed that the Institute be administered by an executive officer who would report directly to the President of the University. Depending on the individual involved and the magnitude of the program, this officer might have the title of "Chancellor" -- analogous to the practice at the University of Wisconsin for its statewide extension system. The relationship of such an officer to the College of Medicine and other University units would have to be carefully considered, however, before a definite decision could be reached as to the specific form of governance of the Institute and the title of the chief executive officer.

As regards other aspects of organization, each of the training units might be called a "Center for Postdoctoral Medicine," with accompanying identification of the Institute and the University. Each regional unit would have a Director and appropriate administrative staff. The physicians participating formally in the training program would have University faculty status in the Institute, and would participate in the determination of its policies and procedures. The trainees would also be given suitable Institute titles and status.

No attempt will be made to specify the substance of the Institute's educational program. The decision would have to be made, for example, as to whether to include both internship and residency training or to concentrate upon integrated residency programs in selected specialties. Such a matter, however, could not be settled on an a priori basis; careful analysis and professional evaluation would be necessary, including discussions with specialty boards.

The Center for the Study of Medical Education would be an important resource for analyzing the educational needs in residency training -- perhaps along lines followed by the Center in its collaborative study with the American Board of Orthopaedic Surgery -- and for devising means to improving the training procedures used. The Center has been interested in the development of new techniques for assessing critical components of medical competence in given fields, as a means to evaluating the extent to which different individuals in different settings might move toward the achievement of desirable professional skills.

Postgraduate Medical Education

The University's College of Medicine has long conducted a program of continuing education for physicians, but it has been limited in scope due mainly to the lack of funds. Four years ago, the University sought a moderate increase in its biennial budget for this purpose, but the request was not approved by the Board of Higher Education -- the following reason being given by the Executive Director (the predecessor to the present incumbent in that office):

"It will be the policy of the staff to call attention of the Board to items of program expansion which purport to provide occupationally or professionally oriented short courses to persons gainfully employed in the occupation or profession. In many states such courses are wholly self-supporting from fees charged to attend the course. If the Board chooses this policy, practicing physicians would not appear to be likely subjects for exception to the rule."

It is established University policy to charge the beneficiaries of its extension and public-service activity for participation in such programs. The charges vary from full reimbursement of costs to relatively moderate fees --

depending upon the extent to which the interests of society, and not merely the private interests of individuals, are served. In the case of the Cooperative Extension Service in the field of agriculture, for example, the programs are supported by federal, State, and local (individual and tax) contributions. By far the greater part of the cost is met from public funds.

In the health fields, continuing education for physicians and other health-care personnel can certainly be viewed as being in some measure a contribution to public welfare rather than solely as a product sought by the private practitioner as consumer or investor. Depending upon the nature of the program of continuing education, the public-private components should probably be quite differently weighted. It seems likely that a fully adequate system of continuing education for physicians would involve such a heavy outlay of capital costs -- in the form of communication and computer equipment, for example -- that one could not reasonably expect to recover all the costs from fees charged to individual hospitals or physicians. Some subsidy will be necessary as social investment in better health care; and the more extensive and effective the system of continuing education, the less likely it is that fees charged to individuals can offset all of the costs.

It is proposed that the Institute of Postdoctoral Medicine be given responsibility for developing a statewide system of continuing education for physicians, and that the facilities and operating costs be met from three sources: State funds, federal funds (possibly in part from the Regional Medical Centers Program, P.L. 89-239), and fees collected from participating physicians or hospitals.

The Institute's headquarters should have space, staff, and facilities sufficient for planning and conducting a distinctive statewide program -- including a communications network utilizing telephone, radio, television, and computer facilities. More important than the "hardware," however, would be the "software" -- including the research and development necessary to determine what the needs are, and how best to organize and disseminate the technical information required to meet them.

The Center for the Study of Medical Education would be an invaluable resource for assistance in planning and developing such a program -- partly because of its previous methodological work in this area. The University's Computer-Based Education Research Laboratory also has under way some highly significant developmental work -- on "software" as well as "hardware" -- that promises to make a great impact upon the field of continuing education. These resources and others at the University would be available to assist in the development of the Institute's program of continuing education.

Graduate Study and Research in Medical Sciences

In view of the understandable emphasis on the professional education of physicians, it is sometimes forgotten that an important responsibility of a medical school is the education of graduate students in the basic medical sciences who will become future teachers and research specialists. Although research in these fields has been adequately supported in recent years by the National Institutes of Health, there is, nevertheless, a shortage of faculty members in most of the fields of medical science. (In part, this can be attributed to the competition of more attractive research opportunities, and to lower rewards for teaching.)

The University conducts substantial programs of graduate study in the following departments of the College of Medicine: anatomy, biological chemistry, microbiology, pathology, pharmacology, and physiology. The total graduate enrollment in these departments for the present semester is 187; projected enrollment for 1960 is 329.

The University of Illinois Hospitals

Virtually all of the University's educational activities in the health professions at its Medical Center campus -- as well as much of the clinical research conducted by its faculty members -- depend in some degree upon the facilities provided by the Research and Educational Hospitals. With the expanded program outlined in this report, the dependence would increase greatly. It would be expected, for example, that the referral of cases from throughout the State would be stimulated by the activities of the Institute of Postdoctoral Medicine. Yet the present facilities of the Research and Educational Hospitals are so obsolescent and otherwise inadequate that they fall far short of meeting satisfactory standards even for the present range of activities. Evidence for this judgment is found in the publication entitled "Appraisal of Hospital Obsolescence in the Chicago Metropolitan Area," which was published by the Hospital Planning Council for Metropolitan Chicago in November 1966 -- as follows:

"There is no doubt that lack of sufficient appropriations from state and county legislative bodies has resulted in seriously deteriorated facilities in both Cook County Hospital and the University of Illinois Research and Educational Hospitals. This is particularly deplorable when one considers the critical functions these two institutions serve, not only in the provisions of care to patients but also in education and research."

In these times of rapid advances in medical education and practice, the State cannot afford for the University of Illinois to continue indefinitely to operate its obsolete hospital facilities -- considering particularly its heavy obligations for graduate medical education (250 interns and residents), clinical research, and its growing responsibility for providing model programs in comprehensive patient care involving other health professions. In addition, as already noted, the Research and Educational Hospitals would be expected to provide key resources for the programs of the proposed Institute of Post-doctoral Medicine, as well as to serve far more extensively than heretofore as a referral hospital for physicians throughout the State.

A detailed program is being developed to guide the planning of construction of new hospital facilities and for remodeling the parts of the existing buildings that can continue to be used for hospital purposes. More detailed information can be supplied if needed.

III. DENTISTRY

According to information from the U. S. Public Health Service, the number of dentists in active nonfederal practice in Illinois has been declining steadily for the past twenty-five years. While in 1940 nearly 6,000 dentists practiced in Illinois, by 1964 the number had dropped to approximately 5,200 -- despite an increase in the State's population of some 3,000,000 persons. If present trends continue, it is estimated that the dentist-to-population ratio would be 1:2402 by 1980, whereas the U. S. Public Health Service suggests a ratio of 1:1712 as being desirable.

The University of Illinois believes that this trend can be reversed and the greater part of the deficit in dentist-to-population ratio can be overcome through the program of expansion proposed in this report for its College of Dentistry.

Current Program of Expansion

The University included in its capital budget request for 1967-69 an item of \$19,000,000 (\$11,200,000 in State funds), which would have permitted an increase of 66 per cent in its professional enrollment (D.D.S. degree) and an overall increase of approximately 100 per cent for all types of students. In spite of the evidence of acute shortage of dentists noted above, the Board of Higher Education reduced the University's request for funds by almost 50 per cent (to a total of \$10,300,000), which will permit an increase in the entering professional class from 90 to 130 students, and similar reductions in graduate and paraprofessional enrollment capacities. Construction plans are proceeding on this reduced basis.

Summary of Current and Projected Enrollments

The administration and faculty of the College of Dentistry have reviewed their original plans for expansion and now believe that additional increases would be possible. So from an entering professional class of 99 in 1967-68, there would be an increase to 200 entering students by 1980. This would be 70 students more than the capacity for the new building.

The following are the detailed enrollment figures for the fall of 1967 and predicted enrollments for 1980 -- for the professional, graduate-postgraduate, and paradecimal categories of students:

	<u>Actual 1967 Enrollment</u>	<u>Predicted 1980 Enrollment</u>
First-year dental	99	200
Second-year dental	86	192
Third-year dental	83	187
Fourth-year dental	85	187
Unclassified dental	4	20
Graduate College	33	87
Postgraduate	17	75
Dental assistants	26	50
Dental hygienists		46
Dental technicians		46
<u>Total</u>	<u>433</u>	<u>1090</u>

This further increase would yield a total enrollment sufficient to meet the major portion of the deficit of 1500 dentists estimated for Illinois in 1980 by the U. S. Public Health Service.

Two new paradecimal programs are planned (for dental hygienists and dental technicians). Further, almost a threefold increase in graduate enrollment is projected, for students preparing for careers in dental teaching or research.

IV. NURSING

Like the other health professions, the field of nursing is beset by severe shortages both nationally and within Illinois. This condition exists in spite of the more rapid rate of growth in nursing personnel than in population -- partly reflecting a decline in the proportion of physicians' time devoted directly to patient care, increasing federal support for hospital services to patients, and marked increases in the time spent by professional nurses in training and supervising auxiliary personnel.

In October 1965, a special body entitled the Illinois Study Commission on Nursing was created by the Illinois Nurses Association and the Illinois League for Nursing -- for the purpose of assessing nursing needs to 1980 and recommending steps to be taken to meet these needs. Pending the completion of the Commission's report during the present academic year, the exact measure of the various types of needs in the field of nursing will not be available. There seems to be little doubt, however, that in order to meet future requirements it will be necessary for qualified training institutions to exert maximal efforts.

The proposals outlined in this report reflect a present assessment of the level of expansion and the distribution of effort among programs which the University of Illinois can now project for its College of Nursing at the Medical Center campus. If the proposal for a full-scale medical school at the Urbana-Champaign campus were to be implemented, consideration would be given to the establishment of a baccalaureate program in nursing that would take advantage of the expanded clinical facilities. But this possibility is not included in the University's present plans.

Role of the University of Illinois in Nursing Education

There are several levels of nursing-service personnel -- registered nurses, practical nurses, and nurses aides and technicians. The following figures show the numbers of individuals employed in these various categories in Illinois hospitals as of April 1966, together with budgeted positions reported as vacant:

	<u>Total</u>	<u>Employed</u>	<u>Budgeted Vacancies</u>
Registered nurses	23,569	19,003	4,462
Licensed practical nurses	6,393	4,677	2,548
Surgical technicians	914	757	202
Aides, orderlies, attendants	32,808	24,811	6,349

Registered nurses are trained in three principal types of institutions: hospitals (diploma programs), junior colleges ("technical nurses"), and degree-granting colleges. The following figures show the numbers admitted to these three types of institutions in Illinois in 1966 and also the number of graduates from each of them:

<u>Type of Program</u>	<u>Admissions in Illinois -- 1966</u>	<u>Graduates in Illinois -- 1966</u>
Associate degree (junior colleges)	214	74
Baccalaureate	601	256
Diploma (hospitals)	2527	1827
<u>Total</u>	<u>3342</u>	<u>2157</u>

In 1966 there were seventy-three nursing schools in Illinois: 56 hospital schools, 7 technical programs in junior colleges, 8 senior-college programs leading to the bachelor's degree in nursing. If present trends continue, it is predicted that by 1980 there will be considerably fewer hospital schools, a manyfold increase in junior-college programs, and the offering of baccalaureate programs in several more senior colleges.

The field of graduate education in nursing has been seriously neglected in Illinois since the University of Chicago closed its graduate department of nursing education in 1958. Other than the University of Illinois, only DePaul University offers courses in nursing service administration and teaching, with relatively small enrollments. It seems imperative, therefore, that the University increase very substantially its enrollment at the graduate level, in order to help towards overcoming serious deficiencies in the following categories of professional personnel: clinical specialists, teachers, administrators (patient-service planners and program directors).

Enrollments in the College of Nursing

The figures in the following table present a breakdown of actual enrollments for the fall term of 1967 and predicted enrollments for 1980:

	Actual 1967 Enrollment	Predicted 1980 Enrollment
Undergraduate	238	753
Second year	(75)	(250)
Third year	(67)	(214)
Fourth year	(58)	(188)
Continuation (RN)	(38)	(101)
Graduate	38	565
Master's level	(38)	(525)
Doctoral level		(40)
	—	—
<u>Total</u>	276	1318
	==	==

The University has under construction a new building for the College of Nursing which would provide for the following enrollment levels: undergraduate (baccalaureate degree), 644; master's level, 300; doctoral level, 25. Although no precise estimates have been made of the amount of additional space that would be needed to accommodate the additional enrollments projected above for 1980, more space obviously would be required to meet the revised enrollment levels.

V. PHARMACY

The State of Illinois licenses approximately 300 pharmacists annually, whose backgrounds are as follows: (a) approximately one-third are graduates of the University's College of Pharmacy at the Medical Center; (b) another third are Illinois residents who have graduated in pharmacy at institutions in other states; (c) approximately another third of the total have transferred their licenses into Illinois from other states. The Dean of the College of Pharmacy estimates that a manpower shortage exists in this field, due partly to a small out-migration from the State and to attrition from retirement and death.

Enrollment Demand in Pharmacy

Since the University's College of Pharmacy is the only such school in Illinois -- public or private -- its statistics on applications for admission in relation to approvals and final registration figures constitute reasonably good measures of the effective demand for education in pharmacy in the State. A recent tabulation of figures covering the four-year period 1963-1967 shows that in each of these years virtually all eligible applicants were offered admission. Furthermore, the College was able to accommodate without any overcrowding all of the accepted students who chose to enroll in the professional program.

Enrollment Projections to 1980

The following figures show actual enrollments by educational level for 1967 and predicted enrollments for 1980:

	Actual 1967 Enrollment	Predicted 1980 Enrollment
Undergraduate	576	771
First year	(196)	(245)
Second year	(151)	(192)
Third year	(119)	(169)
Fourth year	(103)	(155)
Unclassified	(7)	(10)
Graduate	54	178
Level I	(15)	(60)
Level II	(39)	(118)
<u>Total</u>	<u>630</u>	<u>949</u>

An addition to the building occupied by the College of Pharmacy is almost completed, and the new space should accommodate a considerable portion of the projected increase. No precise estimates of the space required for the projected enrollments have yet been made. The substantial increase in graduate enrollment will be necessary for the education of teachers, research specialists, and administrators.

VI. PUBLIC HEALTH

The University of Illinois does not at present offer work leading to professional degrees in the field of public health. The general reasons for the University's delay in establishing such programs have been: (a) the lack of resources in the face of pressing demands from existing fields of study, and (b) the relative lack of sharply-focused need for the granting of special degrees in public health, in view of the University's heavy involvement in educational activities that otherwise contribute to health care and to the improvement of environmental conditions affecting health.

A recent review of the problem, however, has resulted in the decision to plan towards formal degree programs at both the master's and the doctoral levels. At its Medical Center and Urbana-Champaign campuses, there are many departmental and interdepartmental offerings relating to public health, and they would provide strong support for graduate study in that field. The emerging graduate program at the Chicago Circle campus would also offer related instruction in the behavioral sciences.

The University would establish curricula designed to meet the Criteria and Guidelines for Accreditation for Schools of Public Health formulated by the American Public Health Association. These professional programs would be different in nature and purpose from departmental and interdepartmental curricula leading to graduate degrees in specialties that qualify recipients for important roles in public-health research and in the administration of technical agencies directly concerned with public-health problems (e.g., sanitary engineering).

Educational Program

The University proposes to develop programs of professional study leading to the degrees of Master of Public Health and Doctor of Public Health to be administered by a special school within the Graduate College. The doctoral program might be delayed until after the master's program had been established and adequate planning for the higher degree could be done; but such a decision should be made in the concrete context of program planning, and in terms of the leadership and other resources available.

Two types of programs are recognized in the Guidelines for Accrediting Schools of Public Health, whether for the M.P.H. or the D.P.H. degrees: (a) one leading to a technical-scientific degree, with emphasis upon specialty training; (b) the other leading to a generalist-administrative degree. All of these programs include instruction in the following fields which are considered basic to public health:

1. Nature of man and his physical and social environment, and his personal and social interaction.
2. Basic techniques of biostatistics and epidemiology.
3. Basic techniques of administration, particularly of health-care programs.
4. Economic and political setting of health services.
5. Application to community health.

As these topics suggest, education in public health is broadly interdisciplinary in nature, requiring careful planning and the coordination of specialists drawn from several areas. It would be necessary to add to the University's existing resources the administrative staff and faculty whose interests lie primarily in public health as a professional field and who would

constitute the school's "core faculty." The University's present departments could provide most of the instruction needed in special fields for the two professional degrees.

Organization and Administration

The administrative reorganization resulting from the establishment of the chancellorship system at the University of Illinois makes it difficult at this time to specify precisely how the new programs in public health would be administered. It appears likely that there will be decentralization of the Graduate College -- heretofore a University-wide organization -- with an independent graduate college being established at each campus. Since it seems highly desirable to establish the public health program on an intercampus basis -- utilizing resources from all three campuses -- a new type of mechanism for administrative coordination of the program will have to be established. Undoubtedly, this can be done within the framework of the chancellorship system by mutual agreement on cooperative arrangements. A special committee will be appointed in the near future to study this problem and to make recommendations for the administration of the program. (A similar problem will be discussed in the case of a proposed doctorate in social work -- in the following section.)

Enrollment Projections

An entering class of some 20-25 students might be expected initially to enroll for the M.P.H. degree -- with the number possibly being higher if the program were made available both in Chicago and in Urbana-Champaign from the beginning. All-University enrollment ranging between 100 and 200 students

would seem to be a reasonable expectation by 1980 -- based upon present figures for other schools of public health.

Supporting Research Centers

Mention should be made of several research organizations at the University of Illinois which either are currently concerned with public-health problems or which have technical capabilities that could support a public-health program. The Center for Zoonoses Research at the Urbana-Champaign campus now conducts research on public-health problems -- especially in the field of epidemiology -- and draws its participants from several colleges and departments. The Center for Human Ecology in the Graduate College has been more concerned with the organization of instruction and with the systematization of knowledge related to man-environment relations, and sponsors interdisciplinary courses that would be highly useful to the professional program in public health. At the Chicago Circle campus, the new Center for Urban Studies probably will develop programs having significant relationships to the field of public health (studies of air pollution and water pollution are possibilities). Finally, the proposed Center for the Study of Patient Care and Community Health -- to be described later in this report -- would provide important training and research opportunities to public-health students, especially at the doctoral level.

VII. SOCIAL WORK

Professional education in social work is offered at the University of Illinois in the Jane Addams Graduate School of Social Work. The program is administered through the Graduate College, and the present curriculum leads to the degree of Master of Social Work. Parallel programs are offered at the Urbana-Champaign and the Chicago Circle campuses, under a single administrative organization. With the reorganization of the University under the chancellorship system, it is possible that the two relatively autonomous instructional programs will be assigned to the respective graduate colleges of these two campuses.

The Role of Social Work in Health Service

Professional schools of social work from the beginning have included the education of medical and psychiatric social workers among their major responsibilities. The health services, furthermore, have made increasing use of social workers in the treatment of illness, in preventive health programs, and in rehabilitative services -- with the result that the demand for professional personnel in these fields has never been fully met by professional education in this field.

A recent report of the Task Force on Social Work Education and Manpower of the Department of Health, Education, and Welfare projected a need by 1970 of almost 100,000 more social workers with graduate-professional education for public services alone -- a considerable number of this total being required for the health services. This projection reflects the extensive expansion of public services under welfare amendments to the

Social Security Act, and the expanding federal programs in the field of health care. With respect to Illinois, a recent analysis made by the Council on Social Work Education and the National Association of Social Workers presents information showing that this State would require an increase of 61 per cent in professionally-educated social workers to bring it up to the recommended standard of one social worker per 1500 individuals in the total population. By comparison, the State of New York showed a deficiency of only 35 per cent.

Proposed Expansion of Enrollment

The following figures show current enrollments for the degree of Master of Social Work at the University's two campuses and projections for 1980:

<u>Year</u>	<u>Chicago Circle Campus</u>	<u>Urbana-Champaign Campus</u>
1967-68	151	87
1980-81	550	355

Advanced Graduate Education in Social Work

In order to accommodate the enrollment increases projected for social work at both the graduate and undergraduate levels -- in Illinois and in the nation -- substantially more teachers with advanced degrees will be required. Such individuals will also be needed for the administrative direction of social work agencies, for research, and for advanced clinical practice. At present there are only seventeen schools of social work in the country with doctoral programs, and only one of these schools is located in

Illinois. The faculty of the Jane Addams Graduate School of Social Work has approved the recommendation of a special study committee that a doctoral program in social work be initiated as soon as possible -- preferably not later than 1970-71.

The doctoral degree in social work should utilize the combined resources of the two faculties. As mentioned above in the discussion of public health, if a separate graduate college is organized at each campus -- as now seems likely -- a new mechanism for intercampus coordination of the doctoral program would have to be devised.

VIII. ASSOCIATED MEDICAL SPECIALTIES

The University's School of Associated Medical Sciences was established in 1963 as a division of the College of Medicine at the Medical Center campus. The School has responsibility for the administration of baccalaureate programs in the following specialties associated with medical practice and related aspects of health care: (a) medical art; (b) medical record administration; (c) medical technology; (d) occupational therapy. In all four programs, the first three years are spent at one of the University's undergraduate Colleges of Liberal Arts and Sciences (at Chicago Circle and at Urbana-Champaign). The remainder of the work is offered by the School at the Medical Center campus, where the degrees are granted.

Plans for Expansion

Two new programs are being planned for future introduction, a curriculum in medical dietetics and one in physical therapy. The following figures show current enrollments and projections for 1980:

	Actual 1967 Enrollment*			Predicted 1980 Enrollment*		
	Chicago Circle and Urbana	Medical Center	Total	Chicago Circle and Urbana	Medical Center	Total
Medical art	34	8	42	66	24	90
Medical dietetics				108	40	148
Medical records administration	47	15	62	158	30	188
Medical technology	182	13	195	300	60	360
Occupational therapy	79	33	112	208	80	288
Physical therapy				208	80	288
<u>Total</u>	<u>342</u>	<u>69</u>	<u>411</u>	<u>1048</u>	<u>314</u>	<u>1362</u>

* Instruction in these curricula is divided into: (a) a "liberal arts and sciences" component offered at both the Chicago Circle and the Urbana-Champaign campuses, and (b) a terminal professional component offered at the Medical Center campus. (Students from other institutions may be admitted to the terminal phase.)

The two new programs do not, of course, exhaust the possibilities for the education of medical-technical specialists. A committee of the School of Associated Medical Sciences has identified some sixteen areas as possibilities for further expansion.

An important future responsibility of the School might well be the training of teachers in these technical specialties -- both for positions in junior colleges and for baccalaureate-level teaching. Graduate study for these purposes could be developed cooperatively with appropriate colleges and departments at the Chicago Circle campus.

IX. VETERINARY MEDICINE

The College of Veterinary Medicine at the University of Illinois is the only professional school in this field in the State. In addition to its curriculum leading to the degree of Doctor of Veterinary Medicine, the College offers instruction in veterinary medical science leading to the M.S. and Ph.D. degrees -- with specialization in anatomy, microbiology, parasitology, pathology, physiology, and pharmacology. The College also has administrative responsibility for the Center for Zoonoses Research, which conducts multidisciplinary investigations on diseases common to man and the lower animals. Finally, a program of continuing education is offered to practicing veterinarians throughout the State.

The Need for Veterinary Medical Education

In 1961, Senator Humphrey's Subcommittee on Reorganization and International Organization of the U. S. Senate estimated that by the year 1980 the number of veterinarians in the United States would need to be trebled. This would mean that the present graduation rate of slightly more than 1000 veterinarians annually would have to be increased to 3000 per year. The Subcommittee's report emphasized that this increase was needed for improved human health as well as for the welfare of animals. The economic importance of animal health is suggested by the fact that the value of livestock on Illinois farms, together with the sale of livestock products, amounts to more than \$2,000,000,000 per year.

Expansion of Enrollment

A building program has been started which would provide facilities to replace the seriously inadequate laboratory and clinical quarters in which the College is now housed and to accommodate a substantial expansion in enrollment of professional and graduate students. The following figures show the actual enrollments in these two categories for the current semester and projected enrollments for 1980:

<u>Type of Curriculum</u>	<u>Actual 1967 Enrollment</u>	<u>Predicted 1980 Enrollment</u>
Professional	259	363
Graduate	47	117
<u>Total</u>	<u>306</u>	<u>480</u>

These levels of expansion probably will fall short of meeting the State's needs, and it might become necessary to revise the figures upward.

Veterinary Medical Research and Public Health

The Center for Zoonoses Research, established in 1960, has become an important University agency for multidisciplinary research in the field of public health. Faculty members from some fifteen departments at the Urbana-Champaign and Medical Center campuses are members of the Center, and several of them participate in its ongoing programs. The problems investigated fall within the fields of bacteriology, climatology, ecology, epidemiology, geography, and virology. Supported by grants from the U. S. Public Health Service, the Center for Zoonoses Research has maintained a continuing program of investigation of the emergence and recession of zoonoses -- with emphasis upon the

arboviruses in the Ohio-Mississippi basin. One problem has been a study of the natural history of St. Louis encephalitis, involving study of the human population in given areas, as well as that of birds, small mammals, other vertebrates, and insects.

The Center for Zoonoses Research, and the College of Veterinary Medicine generally, could make significant contributions to an expanded program of instruction and research in the health fields at the Urbana-Champaign campus.

X. RELATED FIELDS

The preceding sections have covered the University's principal programs of education for the health professions -- including the supporting activities of the medical-science departments at the Medical Center campus. In addition, at the other two campuses, a wide range of health-related instruction and research is conducted in basic and applied aspects of the behavioral sciences, the biological sciences, and the physical sciences -- as well as in agriculture, education, and engineering. The following discussion outlines the general nature and scope of these programs -- including enrollment projections for the principal areas more or less directly concerned with health problems.

Urbana-Champaign Campus

The University has more than seventy doctoral programs at the Urbana-Champaign campus, including virtually all of the disciplines customarily classified as behavioral sciences, biological sciences, and physical sciences -- as well as the fields of agriculture, education, engineering, and physical education, and various interdisciplinary programs. Surveys of the national standings of universities in graduate study and research have regularly ranked the University of Illinois among the top ten institutions in the country. The recent study by the American Council on Education^{1/}, for example, gave the University the following rankings among

^{1/} Cartter, Allan M., An Assessment of Quality in Graduate Education. Washington, D. C.: American Council on Education, 1966. Pp. xvi + 131.

American universities: biological sciences, eighth; physical sciences, eighth; engineering, fifth. In the social sciences, the University's programs were not placed among the top ten, but these departments were generally rated as "Strong." (Psychology was rated as "Distinguished," but was classified among the biological sciences in the ACE study -- a partially erroneous grouping, since that Department has been outstanding in both its biological and social aspects.)

The following are the current enrollments and 1980 projections of graduate degree candidates in programs at the Urbana-Champaign campus related to the field of health:

<u>Urbana- Champaign Programs</u>	<u>Actual 1967 Graduate Enrollment*</u>	<u>Predicted 1980 Graduate Enrollment*</u>
Anthropology	81	121
Health Education	15	19
Psychology	240	342
Recreation	43	72
Sociology	86	135
Special Education	99	143
Speech Science	72	113
Animal Science	57	91
Dairy Science	31	56
Entomology	44	65
Food Science	57	86
Microbiology	50	76
Physiology and Biophysics	93	129
Zoology	106	155
Chemistry	429	638
Civil Engineering	267	465
Computer Science	47	73
Electrical Engineering	265	400
Mechanical Engineering	94	151
Nuclear Engineering	67	92
Physics	322	519

* These figures indicate the numbers of candidates for graduate degrees in the programs listed.

Behavioral sciences and education. In addition to doctoral instruction and research in the "basic-science" aspects of the behavioral sciences listed, several programs offer preparation for professional careers in fields concerned with mental health.

Among them, clinical psychology is perhaps the most prominent; and work for both the Ph.D. degree and a new professional degree of "Doctor of Psychology" is offered by the Department of Psychology. The Department of Special Education trains students for remedial work with mentally-retarded and emotionally-disturbed children. These two departments collaborate in the investigations of the Children's Research Center -- a facility operated in conjunction with the Adler Zone Clinic of the Illinois Department of Mental Health. Other participants in this Center's program include the Departments of Recreation, Sociology, and Speech, and the Graduate School of Social Work.

The general field of child development is also strongly cultivated at the Urbana-Champaign campus -- with involvement of the Departments of Elementary Education, Home Economics, Psychology, and Special Education.

The Department of Speech conducts a graduate program in speech pathology and audiology in collaboration with the Colleges of Medicine and Dentistry at the Medical Center campus -- with the support of training grants from the National Institutes of Health. This effort provides a useful model for intercampus administration of graduate study.

Biological sciences. The Departments of Microbiology and of Physiology and Biophysics have instructional and research programs that include much of the content usually covered in corresponding departments in

medical schools. Hence their faculties and laboratories constitute a highly important base on which to build a medical curriculum at the Urbana-Champaign campus. The same is true of biochemistry which is mentioned below under "physical sciences," since it is administered by the Department of Chemistry and Chemical Engineering.

In addition to graduate work in these and other basic fields of biological science, the following special areas are covered either in departmental or interdepartmental programs: applied bacteriology, bioclimatology, food sanitation, medical ecology, nutrition, radiological health. The Center for Human Ecology fosters interdisciplinary study in which environmental health is emphasized -- along with the Center for Zoonoses Research already described.

Physical sciences and engineering. Biochemistry is perhaps the field most directly and widely related to health problems among the disciplines classified as a "physical science" at the University of Illinois. Administered by the Department of Chemistry and Chemical Engineering, the work in biochemistry is one of the country's leading programs of graduate study and research in this field. As already noted, it would serve as a strong foundation for part of the medical curriculum proposed for the Urbana-Champaign campus.

Among other programs of instruction or research in the physical sciences and engineering, specialized work in each of the following departments is related to the field of health: Civil Engineering (sanitary engineering); Computer Science (information systems, computer methodology); Electrical Engineering (Biological Computer Laboratory; Biophysical Research

Laboratory, with research and development in ultrasonic surgery and other bioengineering applications); Mechanical and Industrial Engineering (operations research, bioengineering); Nuclear Engineering (radiological health).

Chicago Circle Campus

The development of graduate study at the Chicago Circle campus has just begun, and the present resources of the various scientific departments are therefore somewhat limited. The University intends, however, to build strong graduate programs at that campus in the behavioral sciences, the biological sciences, and the physical sciences. Furthermore, aspects of engineering will be cultivated which relate rather directly to professional education and practice in the health fields -- especially bioengineering. The University plans to develop these fields in close coordination with related graduate study and research at the Medical Center campus. Qualified graduate students at either campus may now enroll for courses at the other; and every effort will be made to maximize complementary relationships between their graduate and research programs.

Graduate study for the master's degree has been initiated at the Chicago Circle campus this year in the following scientific fields (plus four nonscience fields): biological sciences, chemistry, geology, mathematics; mechanics and materials (engineering), physics, psychology, thermosciences (engineering), and sociology. Proposals for doctoral programs in chemistry and in mathematics have been approved by the University's Board of Trustees and are now before the Board of Higher Education for review (along with two nonscience proposals). Additional programs will be submitted as soon as the necessary resources are available.

The following enrollment figures for 1967 (actual) and 1980 (predicted) indicate something of the rate of growth projected for the behavioral, biological, and physical sciences most directly related to the health fields:

<u>Chicago Circle Graduate Programs</u>	<u>Actual 1967 Graduate Enrollment*</u>	<u>Predicted 1980 Graduate Enrollment*</u>
Anthropology		101
Psychology	25	275
Sociology	7	236
Speech Science		120
Biology	21	207
Bioengineering		52
Chemistry	16	275
Physics	22	200

* These figures indicate the numbers of candidates for graduate degrees in the programs listed.

Special emphasis in graduate study and research at the Chicago Circle campus will be placed upon the fields related to urban problems. A Center for Urban Studies has been established in order to strengthen and coordinate the efforts of individual departments in this broad area. Close relationships will be maintained with studies at the Medical Center campus focused upon patient care and community health.

The field of bioengineering is another area of mutual interest for the Chicago Circle and the Medical Center campuses. A substantial program of graduate study and research is now sponsored in this field by departments at these two campuses, in collaboration with Presbyterian-St. Luke's Hospital.

XI. CENTER FOR THE STUDY OF PATIENT CARE AND COMMUNITY HEALTH

At several points in the preceding discussion there has been reference to a proposed Center for the Study of Patient Care and Community Health. This proposal was developed by a special task force of the College of Medicine, and funds for it were requested for the University's 1967-69 biennial budget. The request was disapproved by the Illinois Board of Higher Education, partly on the ground that the funding of such a program should await the conclusions and recommendations of the Study of Education in the Health Fields.

Need for the Center

Such a center is urgently needed if better methods of utilizing professional manpower and other resources for health care are to be developed, and if effective means are to be devised for controlling the environmental conditions that are deleterious to human health. The following excerpt from the report of the task force proposing the center describes some of the problems that need investigation by such an interdisciplinary organization:

"It is increasingly apparent that the way in which people live and behave influences the time at which they become ill, the nature of their illness, and their readiness to seek and maintain adequate care. Changes in the social and physical environment are having an increasing effect on health and disease. Social disorganization in central urban areas, occupational and geographic mobility of workers, the population explosion, pollution of air and water, all have had a vivid impact on health.

"Research in health care, in chronic disease epidemiology and on the effect on health of the social and physical environment are recognized as major needs of our time. As a modern medical center the University of Illinois has a legitimate concern with

them. However, the study of these issues transcends the interests and capabilities of any one department, college or campus of the University. Research of this kind requires skills and knowledge not only in the health professions, but also in the social and behavioral sciences, in mathematics and statistics, and other related areas. At present, the University has no effective means for conducting research in this area."

Organization

The center would have its headquarters at the Medical Center campus, with its director reporting to the Chancellor. Affiliation with the center would not be limited, however, to the departments at that campus; through joint appointments or other cooperative arrangements, faculty members or agencies at both of the other campuses could participate in the center's work. The full-time, continuing staff of the center might be relatively small, since much of its research probably would be conducted cooperatively with faculty members in participating departments. For special "programmatic" studies, the center might need a relatively large research staff, but its senior staff members should have departmental appointments in their respective disciplines. Among other benefits, this would increase the use of the center as a facility for training graduate students.

Research Program

The specific research activities of the center would emerge from the interests and competences of its members, and from the patterns of grant support available. It is expected that research would be conducted on health care within institutions and within the community. The center's studies generally would be concerned both with qualitative and quantitative aspects of the care of patients -- including the manner in which the various manpower components of the health-care team might be organized and utilized for the most effective delivery of health care.

The research program might include studies of the following problems: health maintenance, early disease detection, primary disease prevention, environmental health, and the incidence, prevalence, and natural history of disease -- including aspects of social and community structure that influence patterns of health and illness.

These research objectives would appear to coincide closely with those of the Center for Health Services Research and Development being planned by the U. S. Department of Health, Education, and Welfare. It seems reasonable to assume that the University's center could look to the new federal agency for cooperation and financial support.

Relationships with Other University Agencies

In addition to the regular departments, schools, and colleges, the Center for the Study of Patient Care and Community Health would cultivate appropriate relationships with other University research organizations, including the following: Center for Urban Studies, Center for Zoonoses Research, Center for Human Ecology, and the Survey Research Laboratory. This new center might also find it fruitful to conduct research on health care in collaboration with the proposed Institute of Postdoctoral Medicine. And its interests and activities would lend strong support to the work of a Graduate School of Public Health -- especially to the suggested training program for a professional doctorate in this field.

UNIVERSITY OF ILLINOIS-URBANA



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